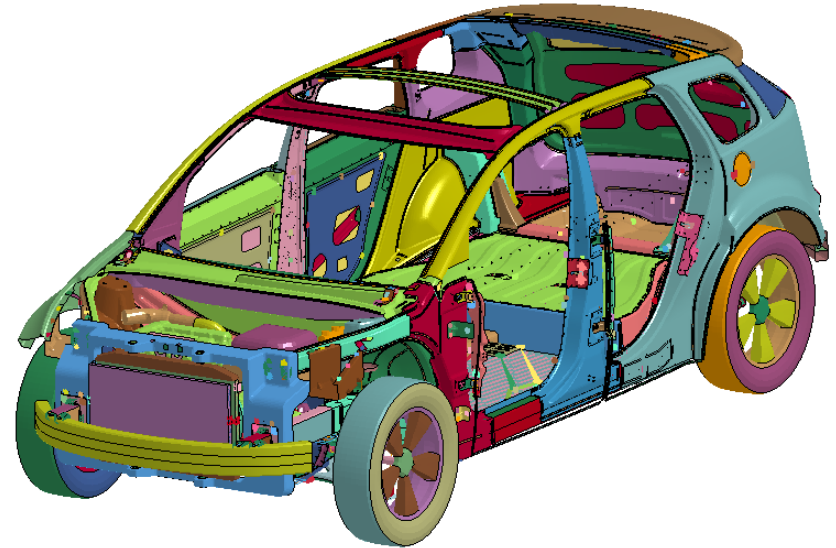
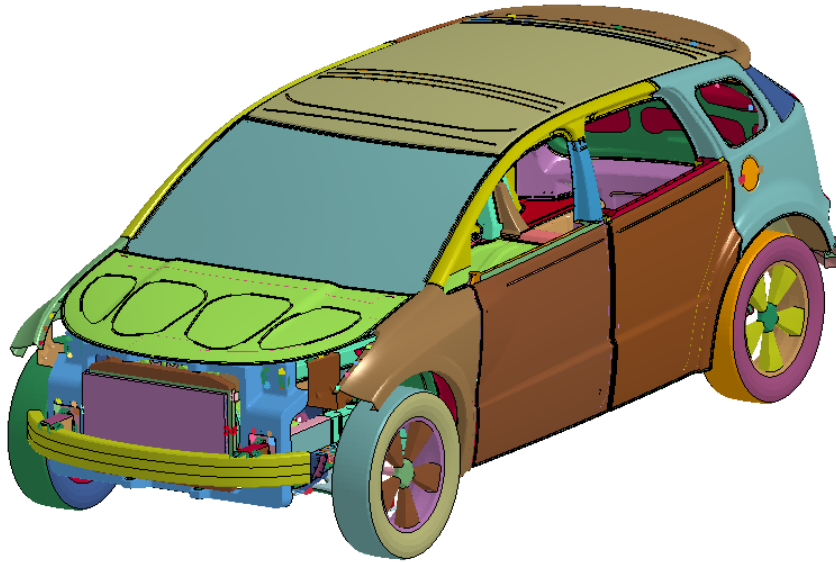




National Crash Analysis Center

2010 Toyota Venza (HO) FE Model Trend & Robustness Study

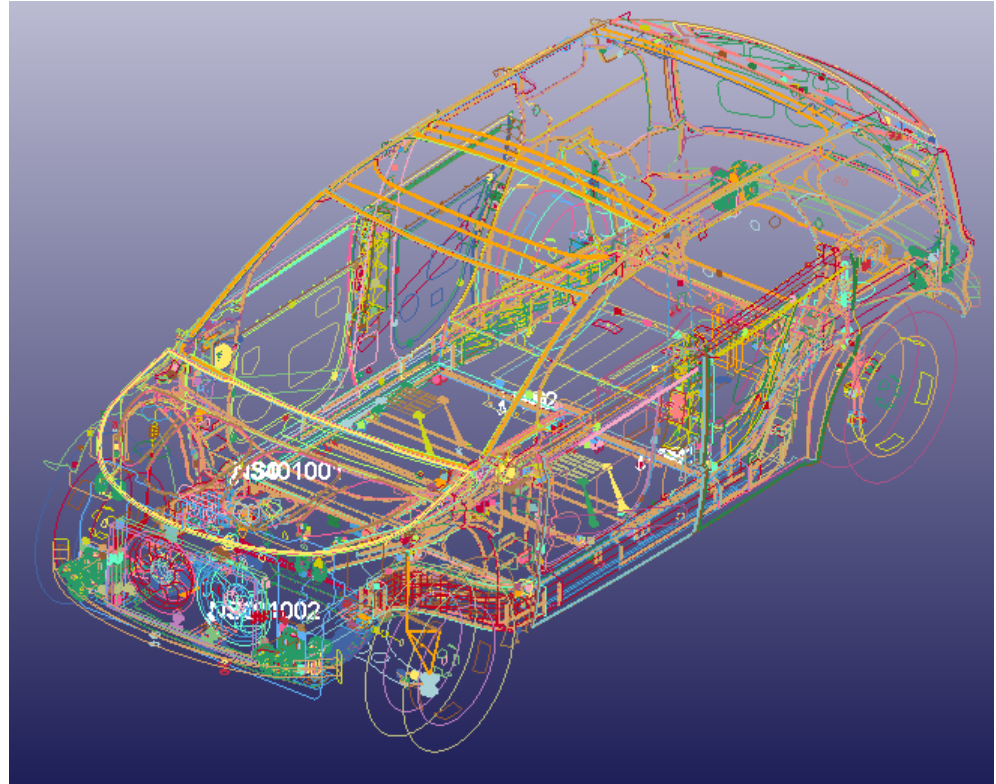
FE Model Information



File Name: Lotus_V27_baseline.key	
Total Number of Parts	722
Total Number of Elements	1156191
Total Number of Nodes	1147413
Total Number of Shell Elements	1021780
Total Number of Solid Elements	133619
Total Number of Beam & Discrete Elements	792

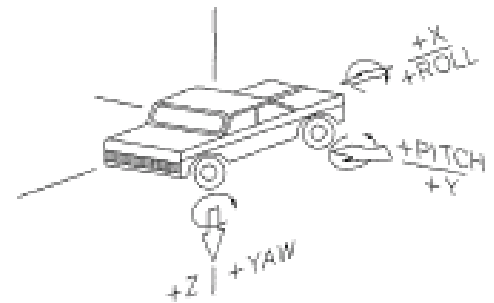
Accelerometers

3401001	ENG_TOP
3401002	ENG_BOTTOM
182	REAR SEAT XMBR RH
181	REAR SEAT XMBR LH



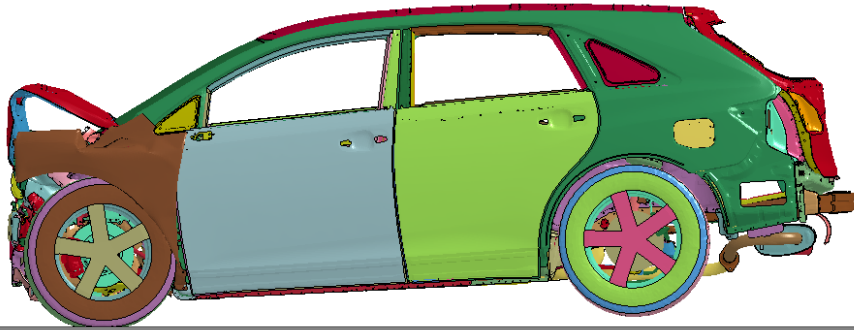
Vehicle Data

	NCAP Test 6601 (2 HIII 50 th)	VRTC Test 40 kmph (1 HIII 5 th)	VENZA <u>BL</u> FE MODEL	VENZA <u>LO</u> FE MODEL	VENZA <u>HO</u> FE MODEL
Weight (Kg)	2074	1786	1767+38	1459+44	1151
Pitch Inertia (Kg-m ²)			3102	2550	2077
Yaw Inertia (Kg-m ²)			3444	2850	2271
Roll Inertia (Kg-m ²)			694	583	445
Vehicle CG 'X' (mm)	1258	1226	1205	1154	1320
Tire	P245/50R20	P245/55R19	P245/55R19	P245/55R19	
Engine	3.5 liter 6 cyl	2.7 liter 4 cyl	2.7 liter 4 cyl	2.7 liter 4 cyl	

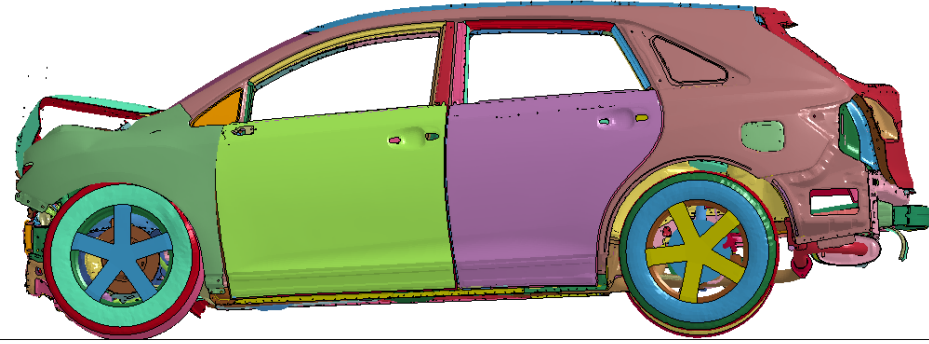


Full Frontal Impact Comparison @ 35 mph

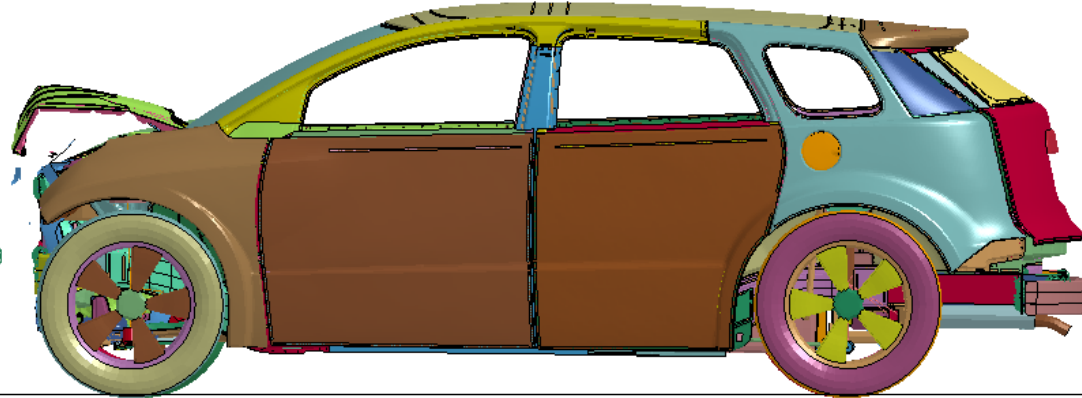
Comparison – BL vs LO vs HO



BL



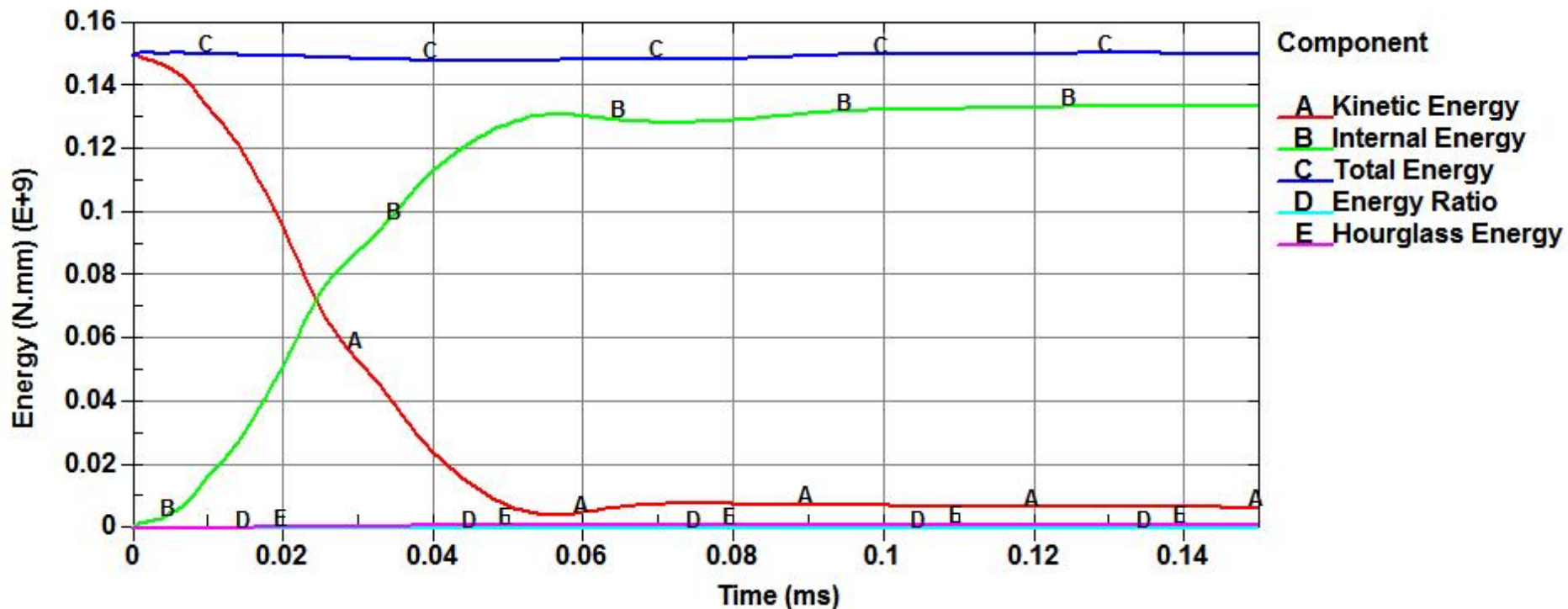
LO



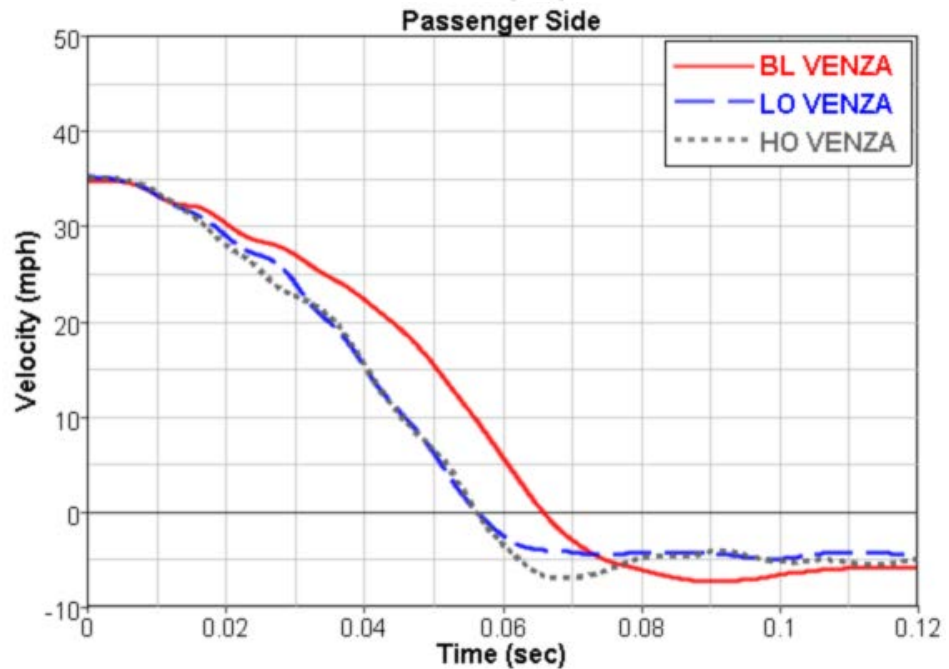
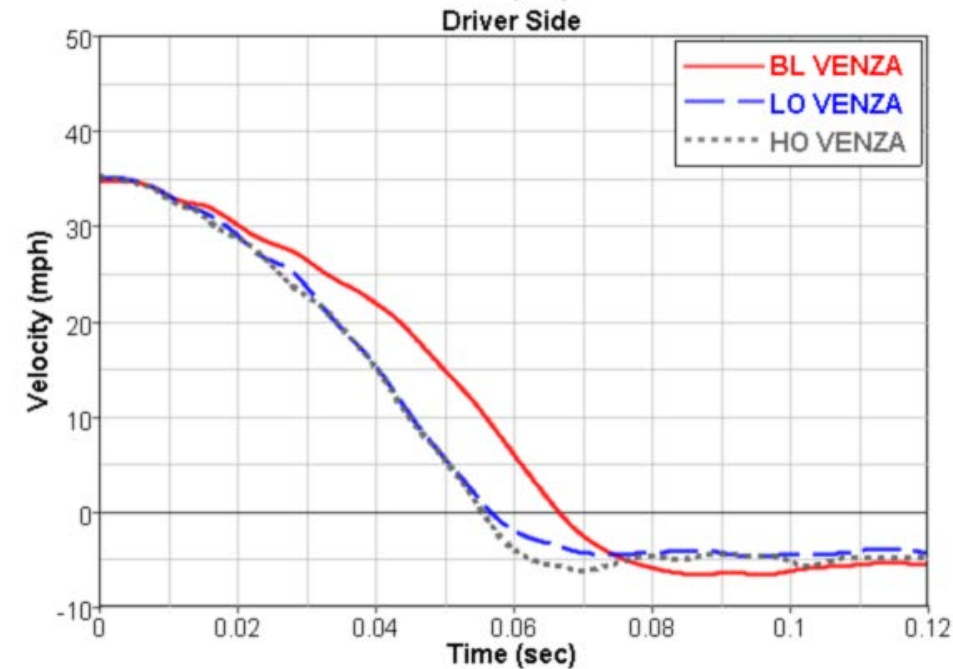
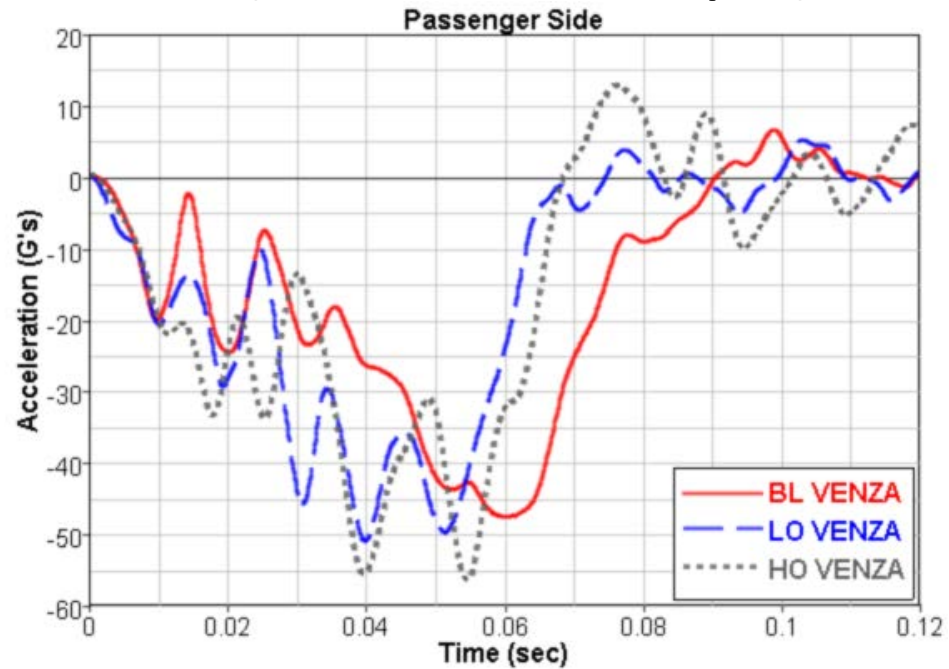
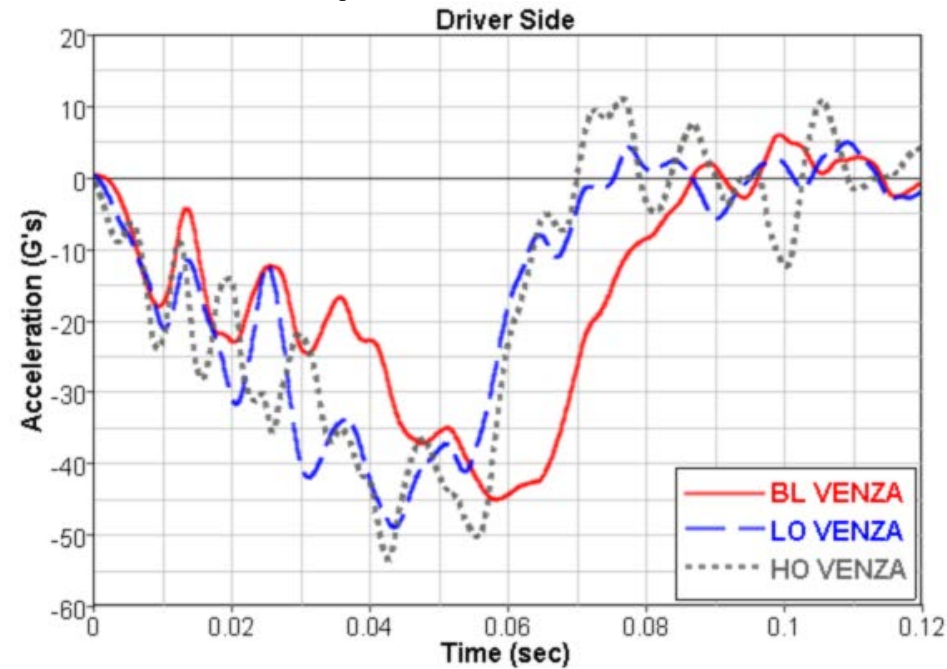
HO

Energy Comparison - HO

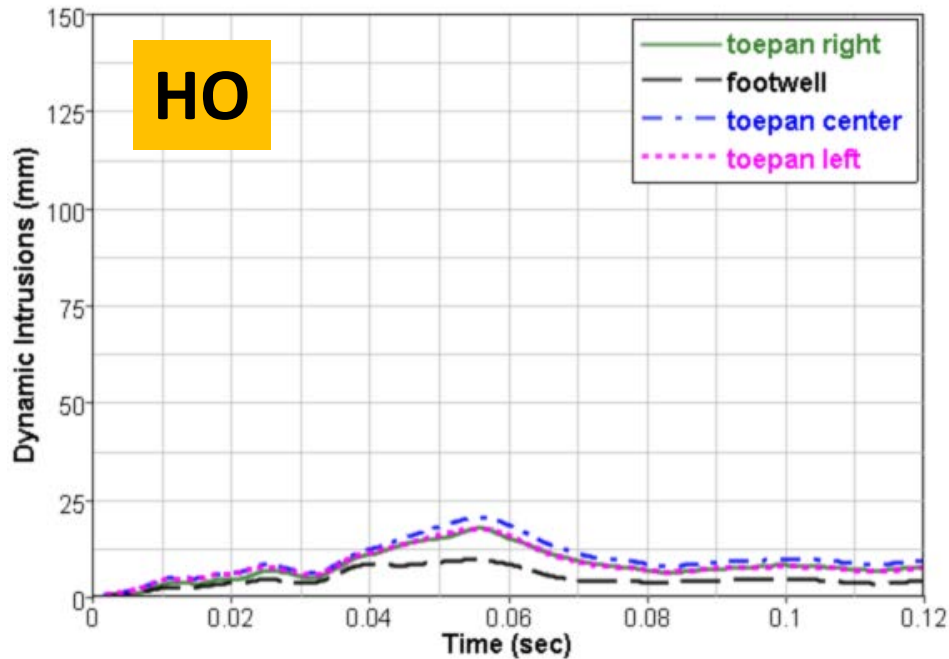
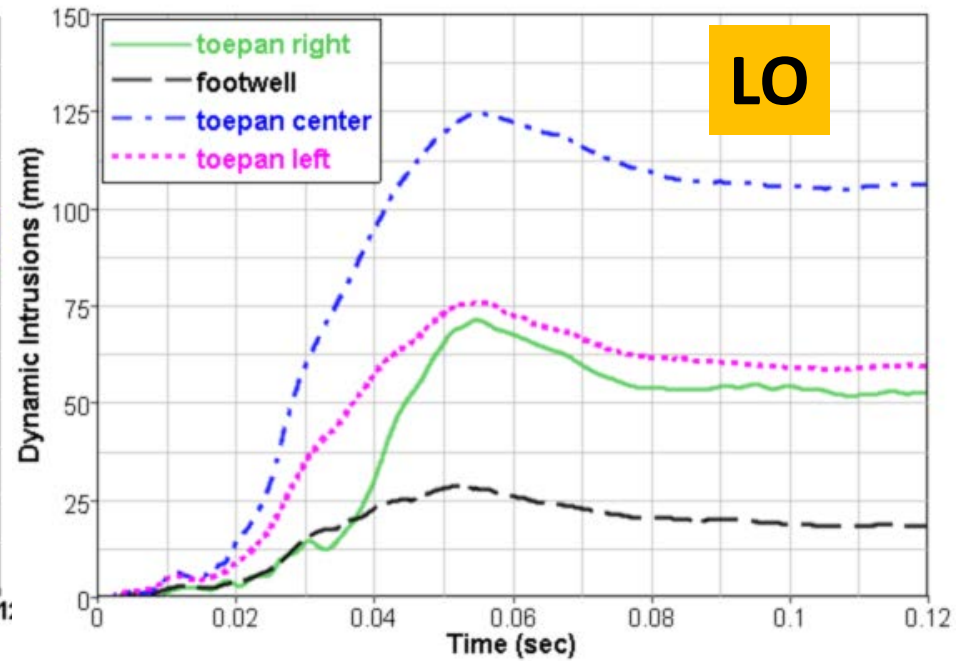
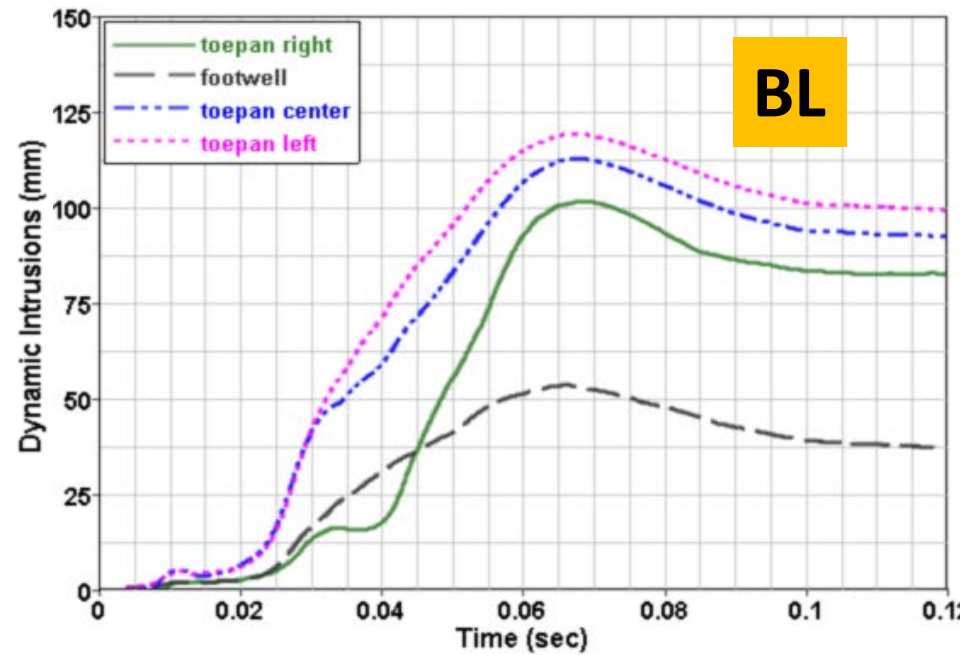
- Energy comparison looks OK
- No energy spikes & total energy remains constant
- Hourglass energy remains low



Comparison – BL vs LO vs HO (Frontal 35 mph)

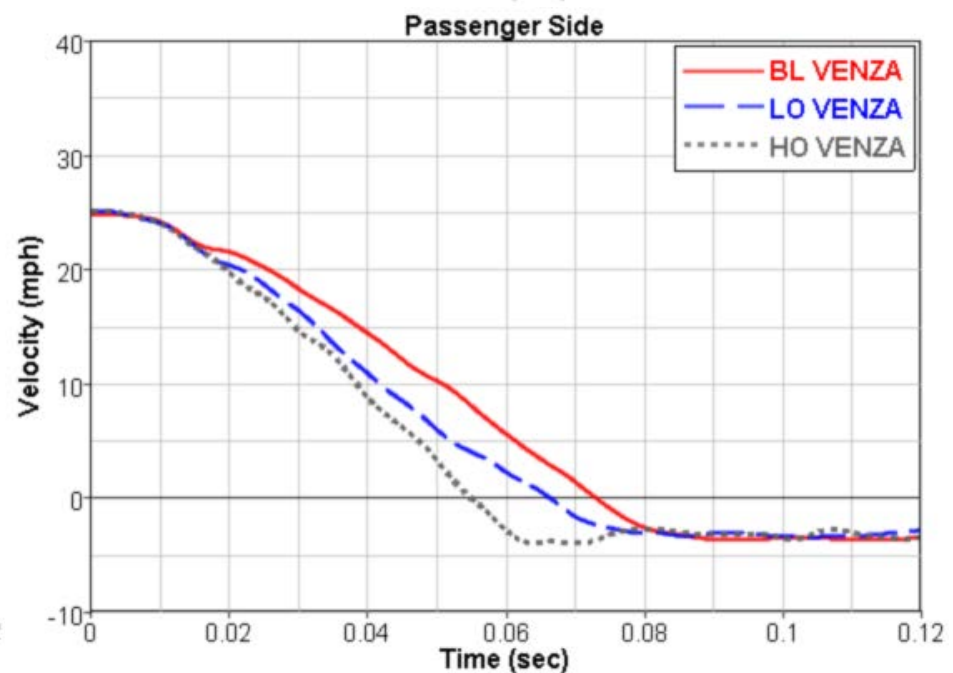
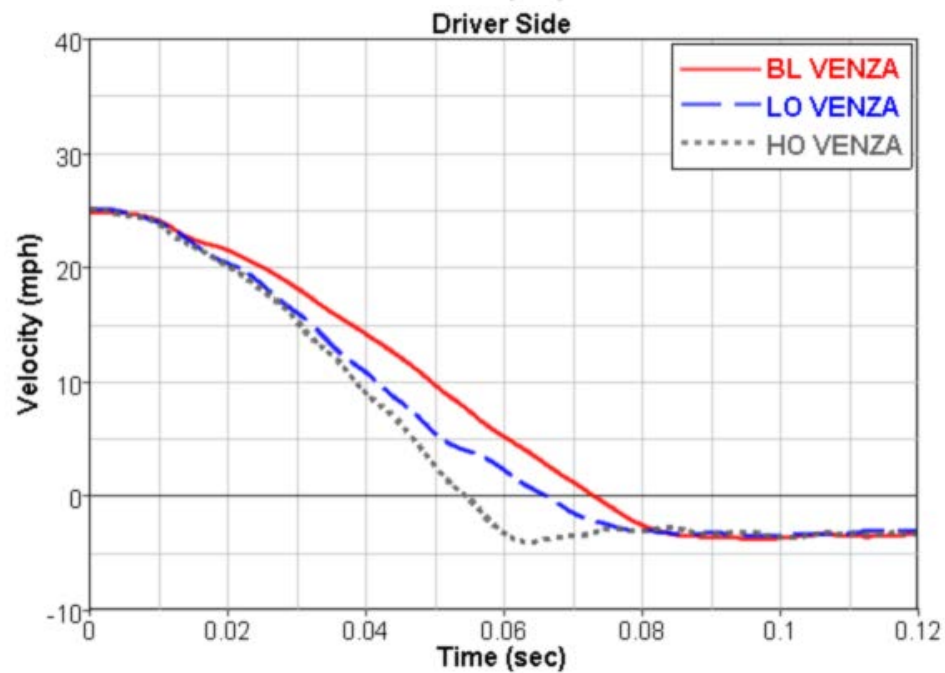
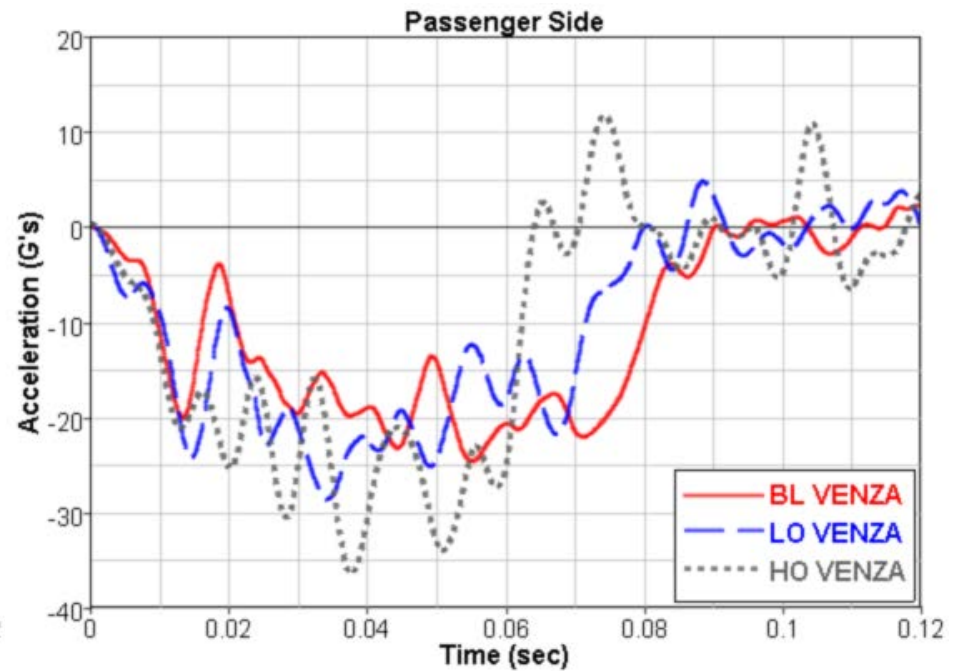
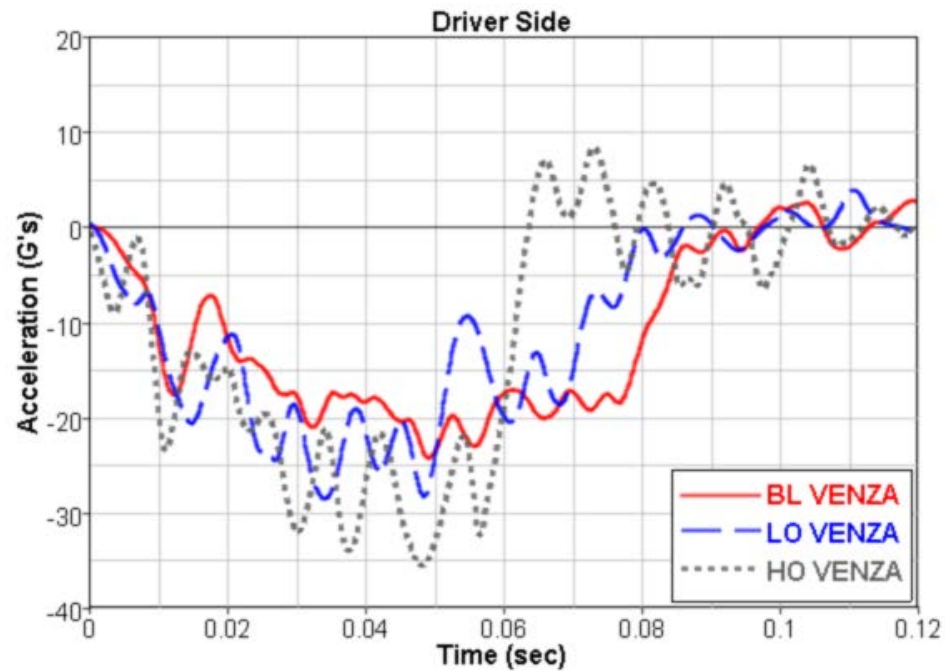


Intrusion Comparison – BL vs LO vs HO (Frontal 35 mph)

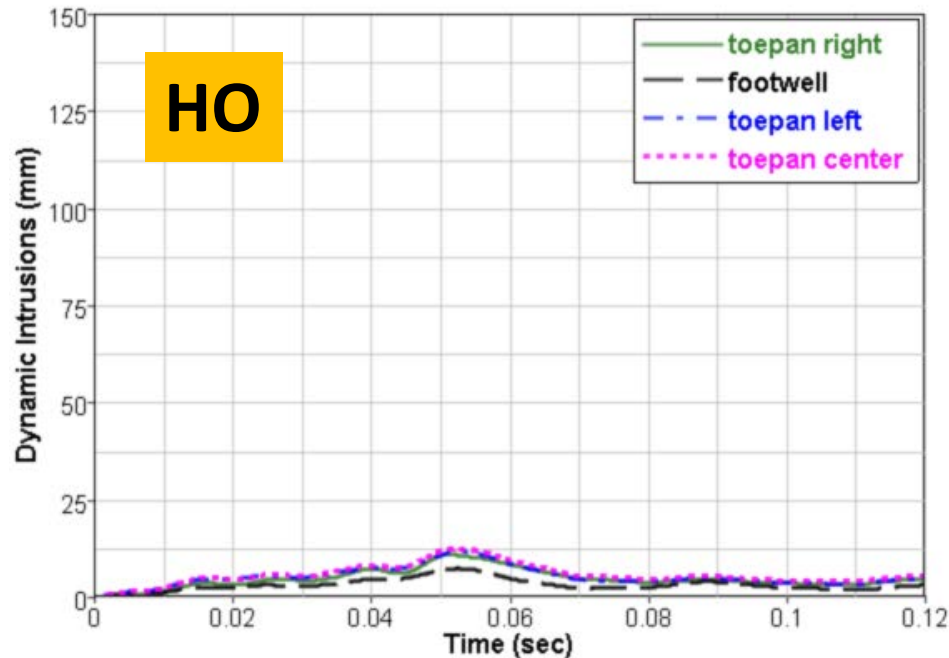
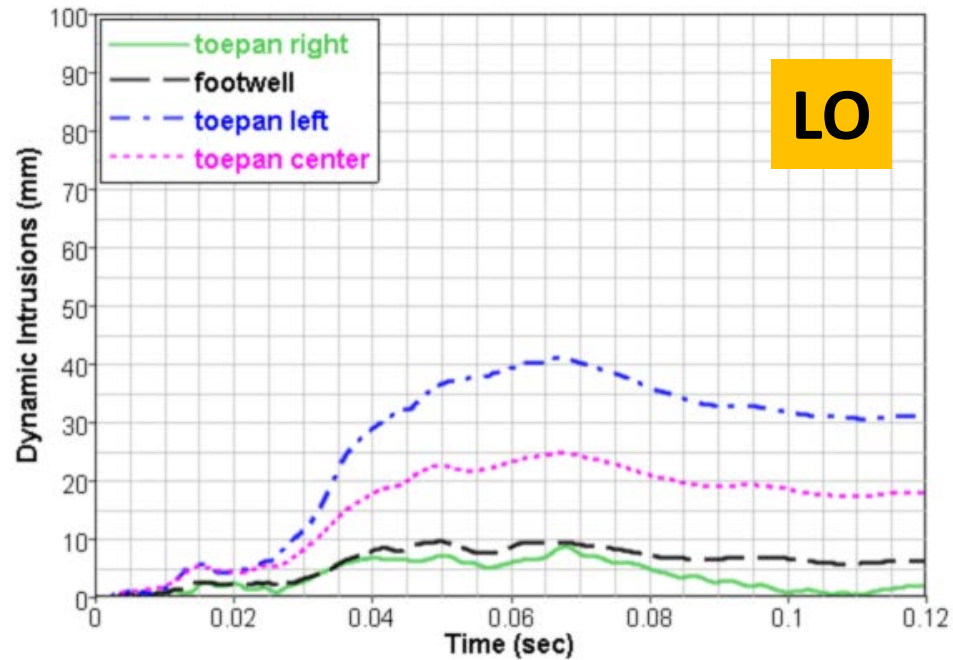
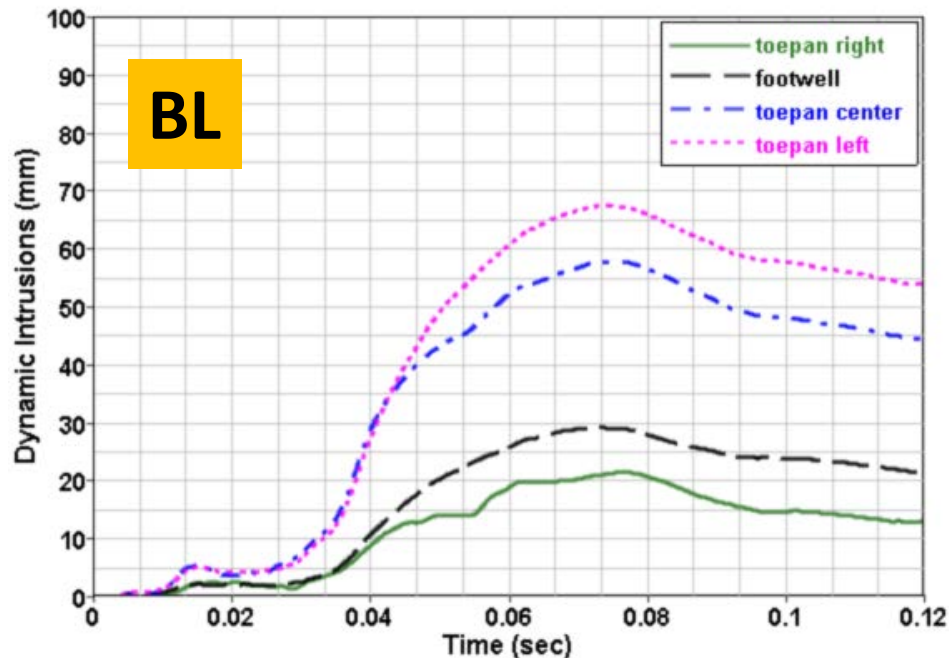


Full Frontal Impact Comparison @ 25 mph

Comparison – BL vs LO vs HO (Frontal 25 mph)



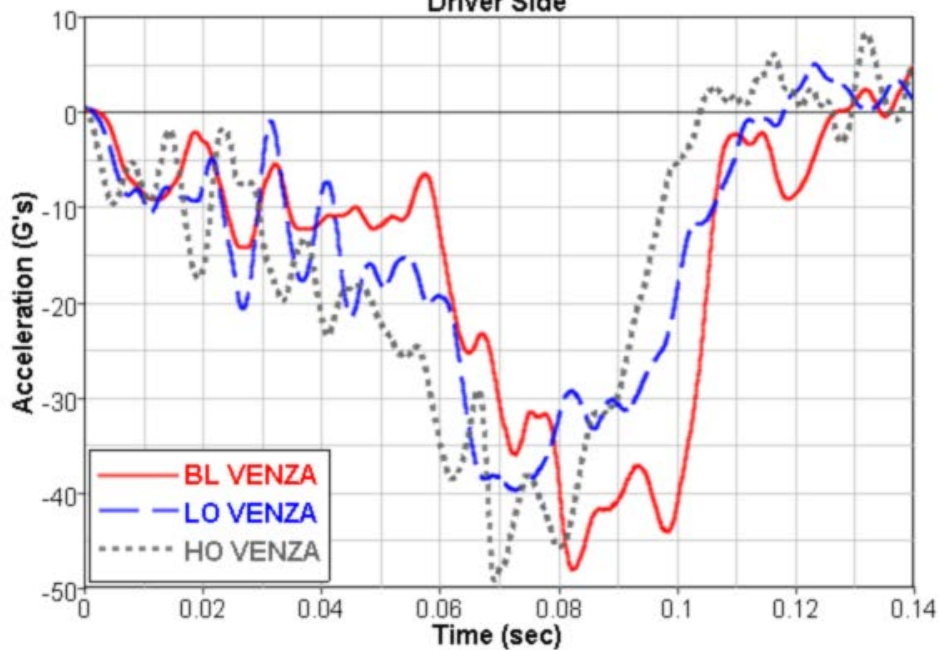
Intrusion Comparison – BL vs LO (Frontal 25 mph)



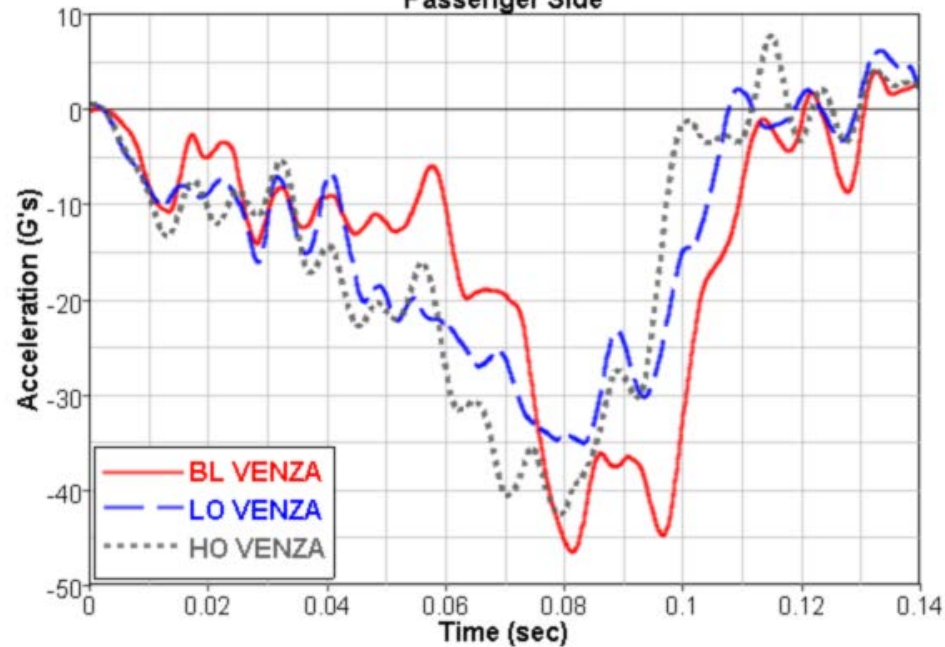
Frontal ODB Impact Comparison @ 40 mph

Comparison – BL vs LO vs HO (ODB 40 mph)

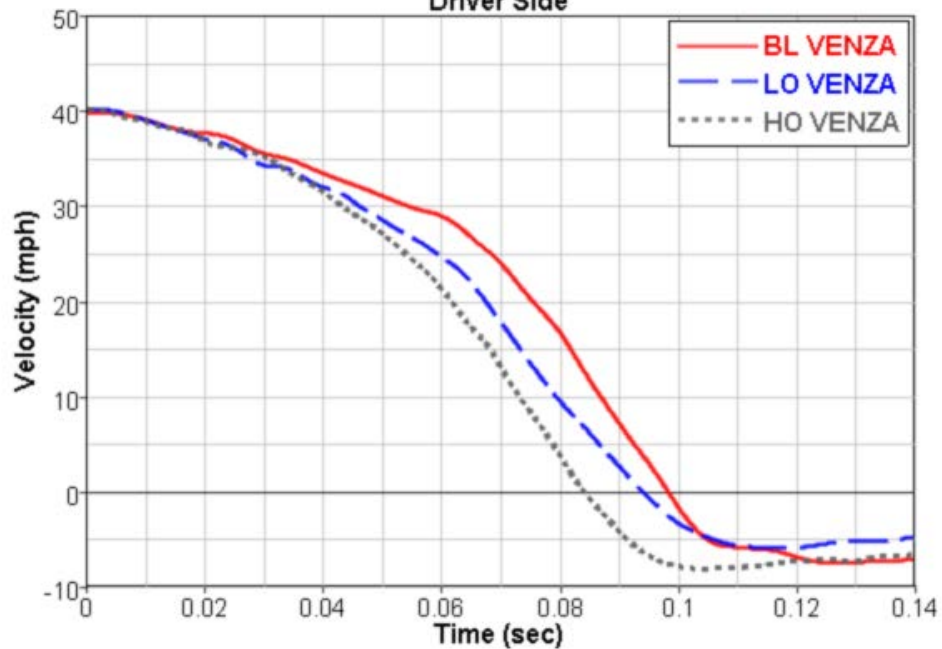
Driver Side



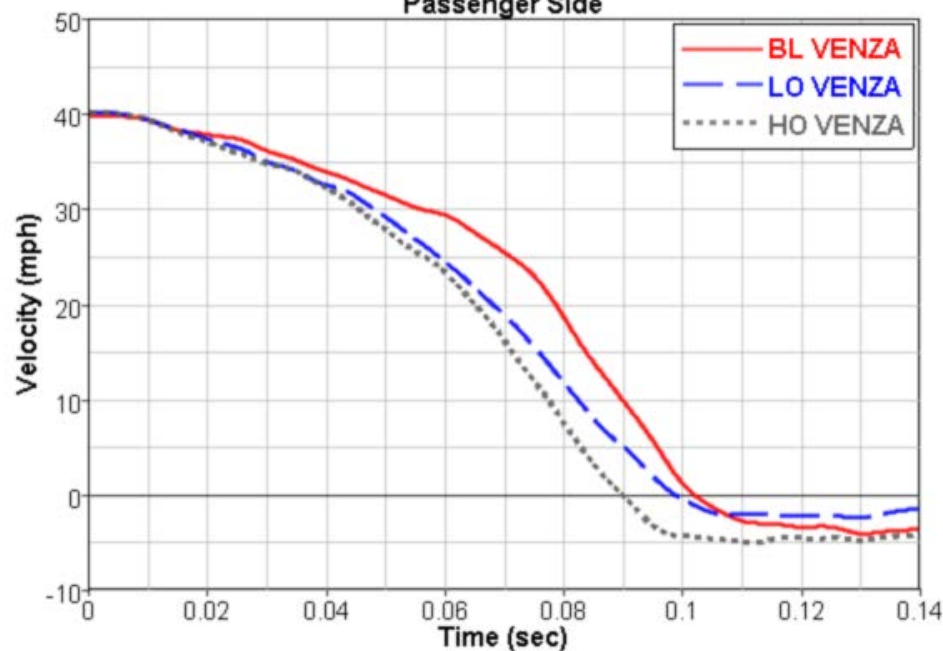
Passenger Side



Driver Side



Passenger Side



HO Venza Robustness & Trend Analysis Simulations

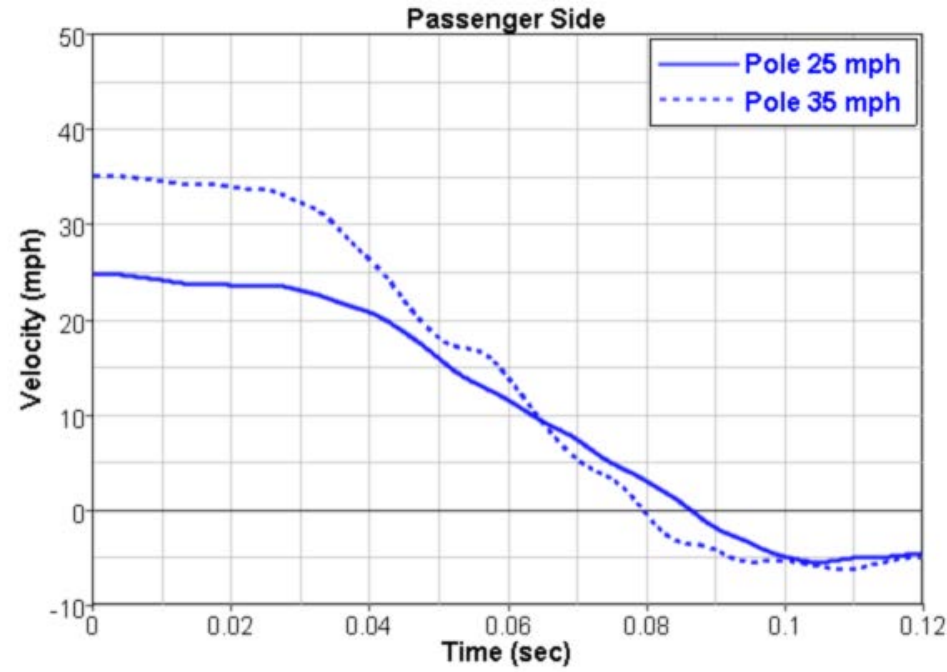
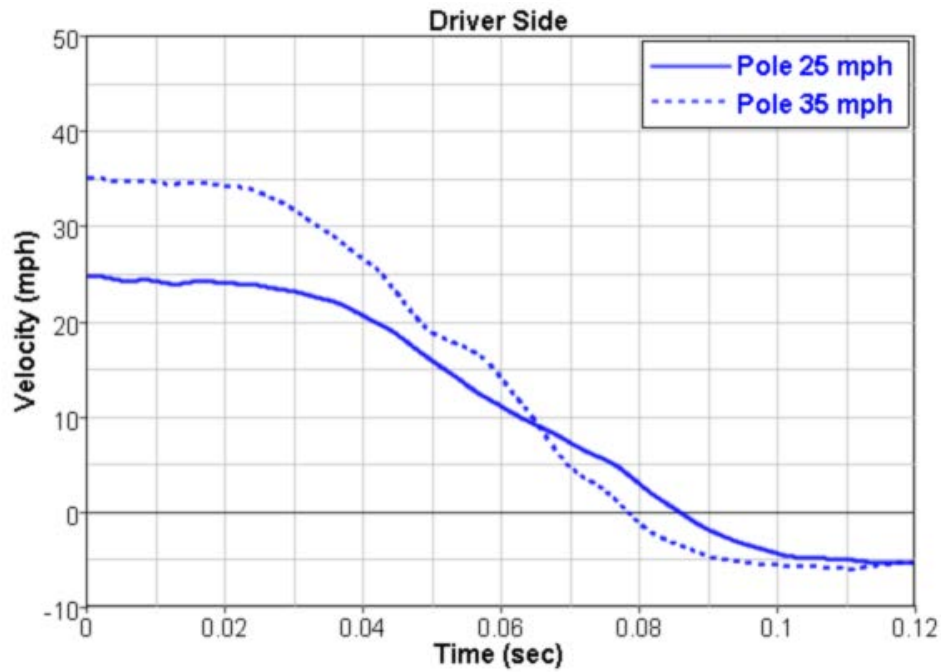
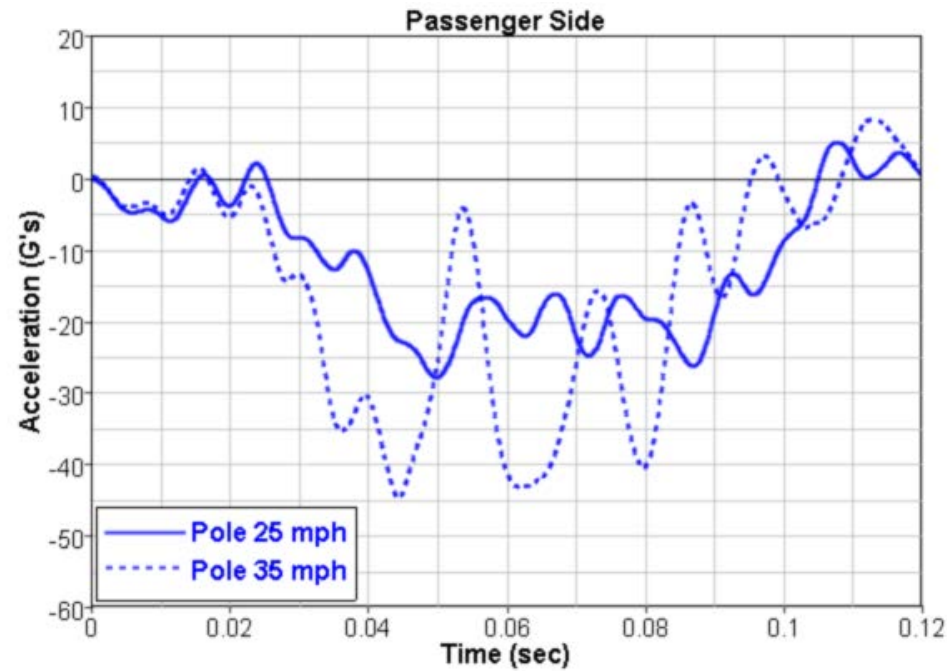
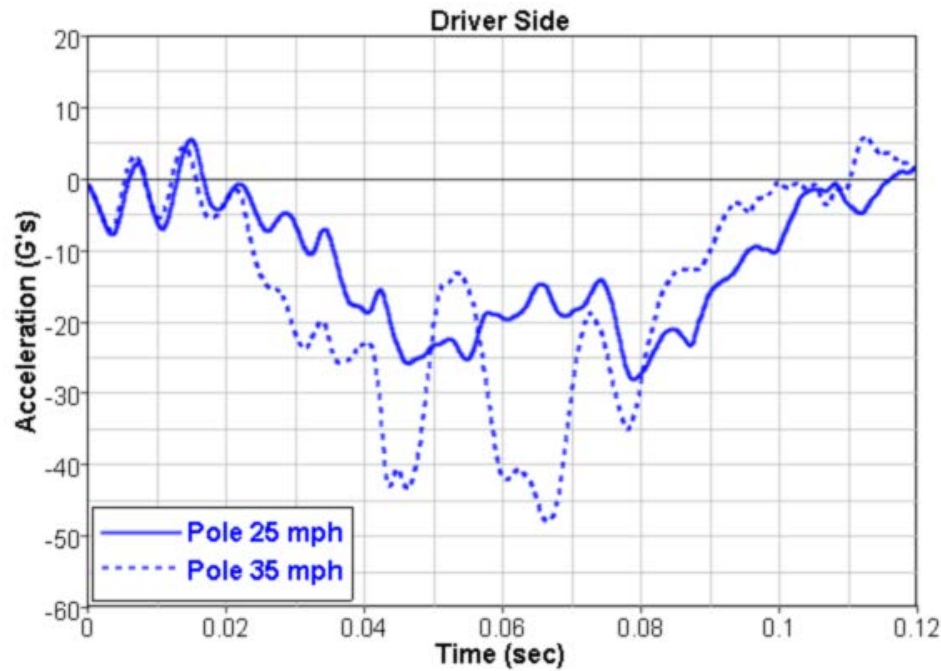
Robustness and Stability Analyses:

- Centerline impact into fixed 10" diameter pole & 35 mph
- 40% and Full overlap v-t-v impact into Silverado @ 35 mph

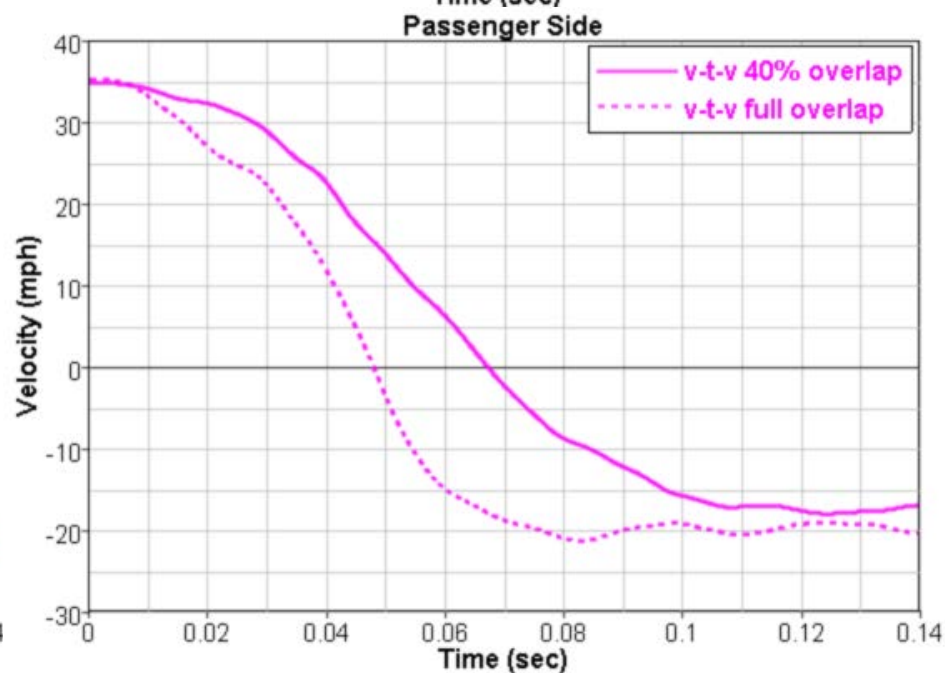
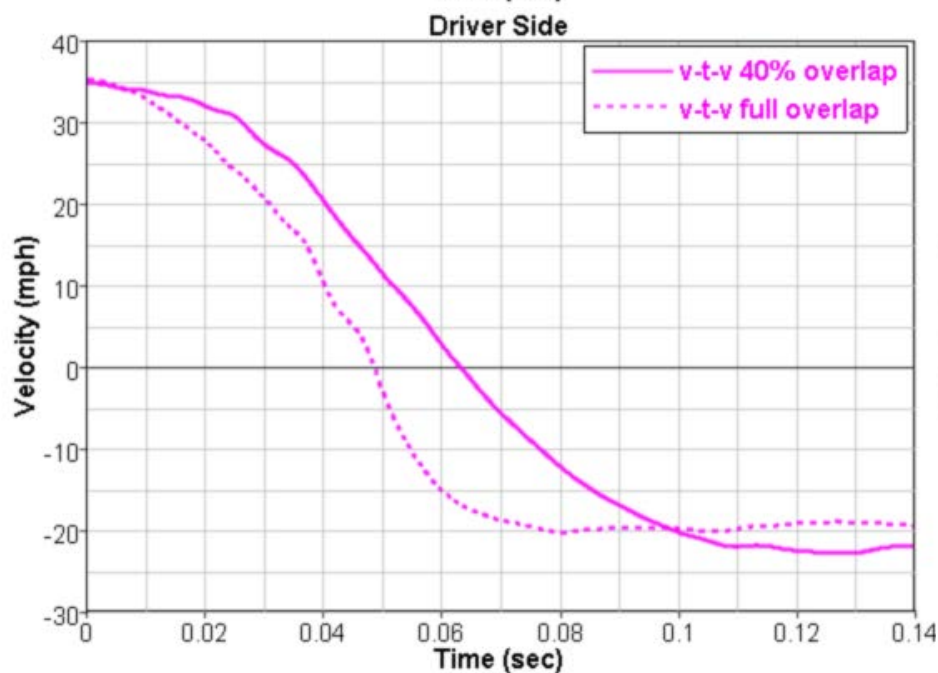
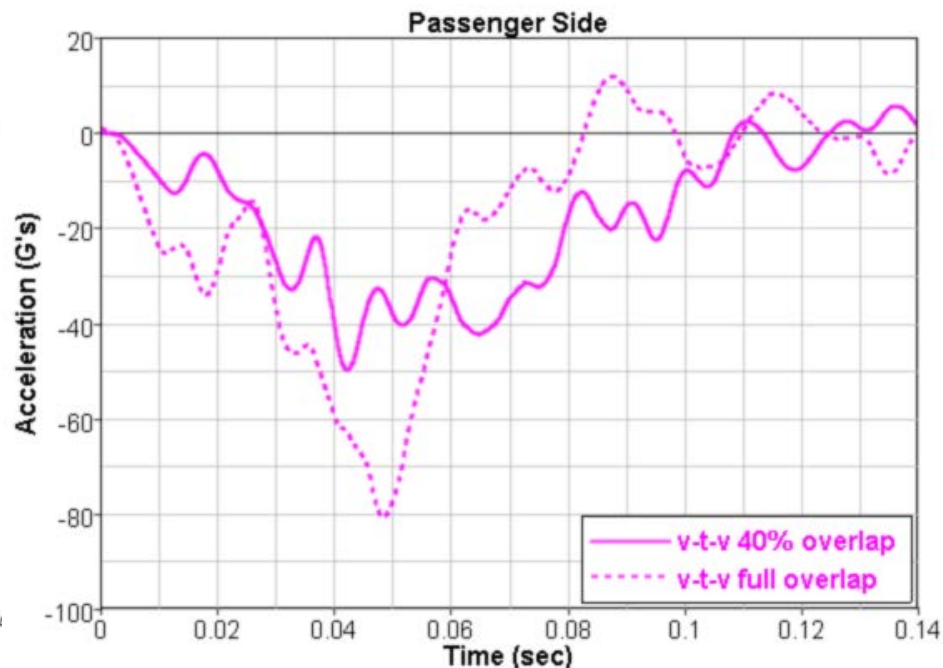
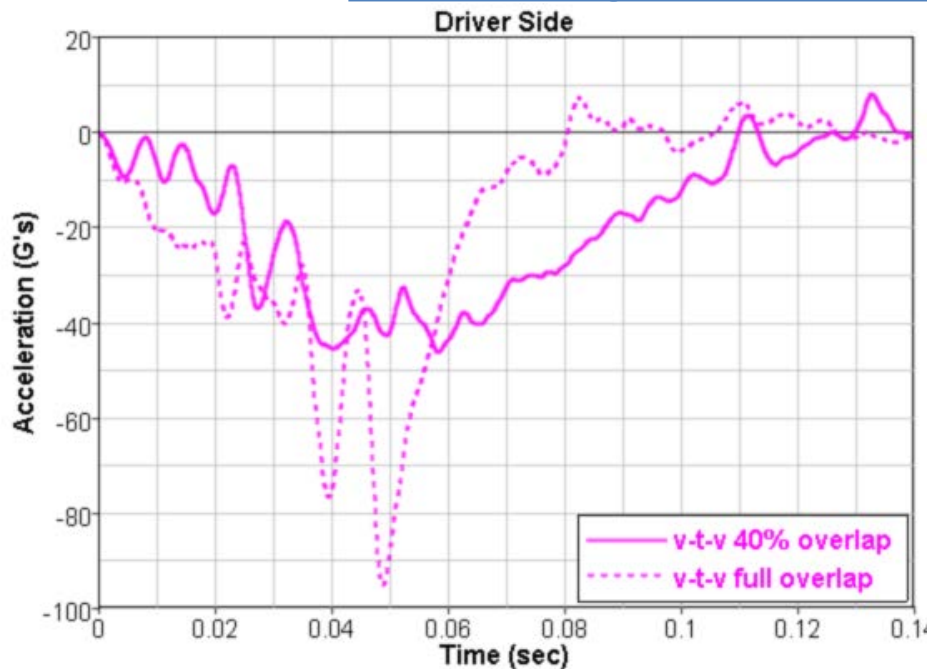
Trend Analysis:

- Full frontal impact into fixed barrier: 35 mph & 25 mph
- 40% overlap impact into deformable barrier: 40 mph & 25 mph
- Centerline impact into fixed 10" diameter pole: 35 mph & 25 mph

Centerline Impact into 10" pole @ 25 & 35 mph

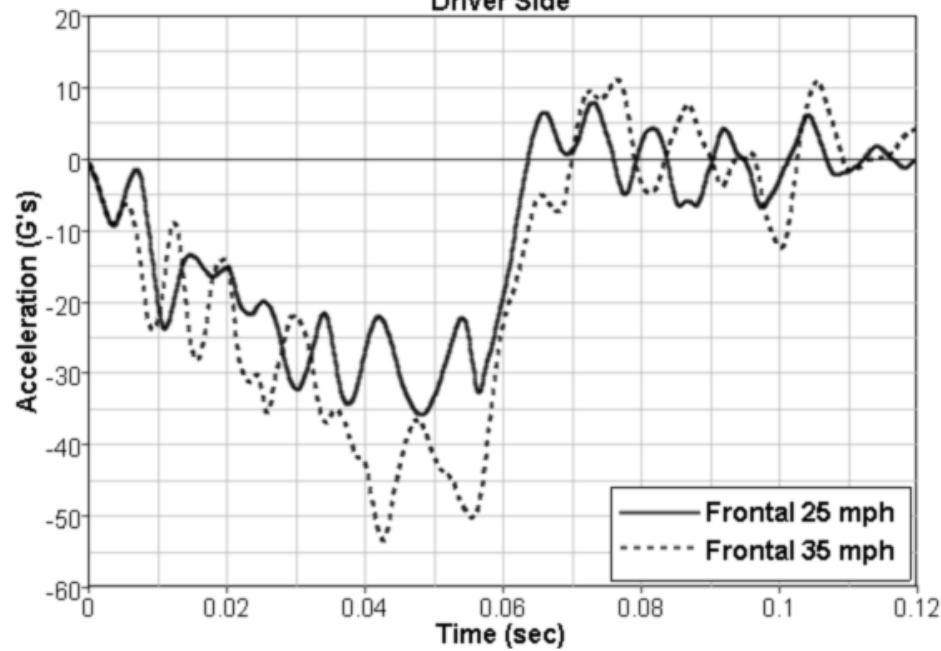


V-t-V impact @ 35 mph with Silverado

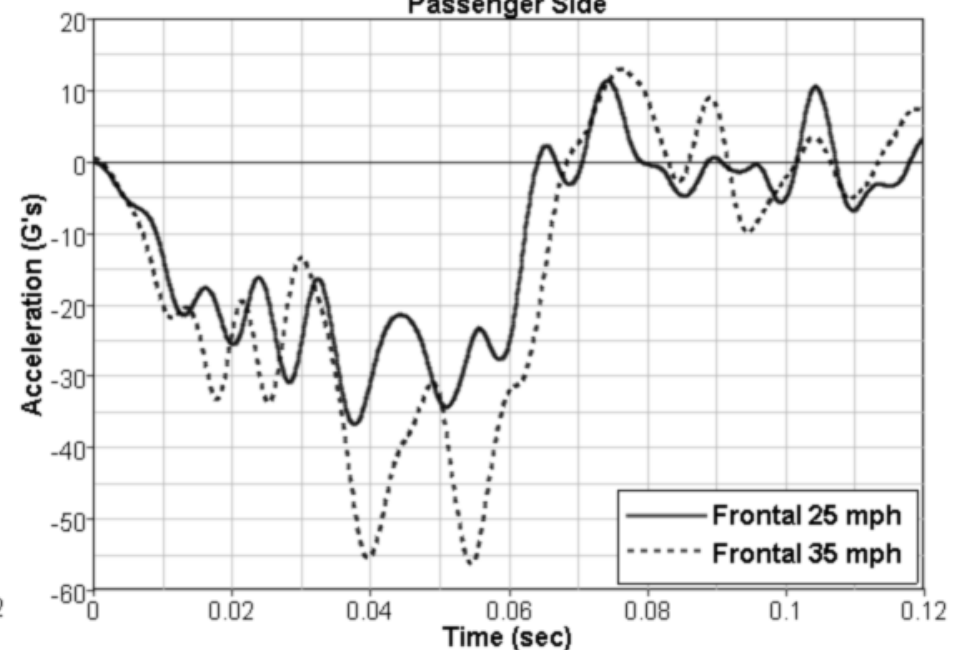


Full Frontal Impact – 25 & 35 mph

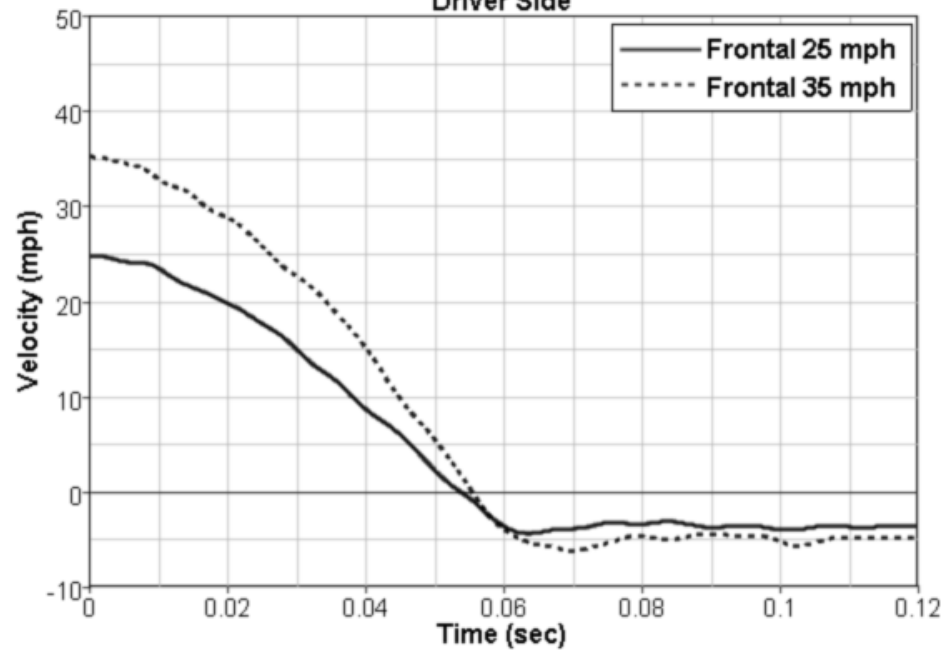
Driver Side



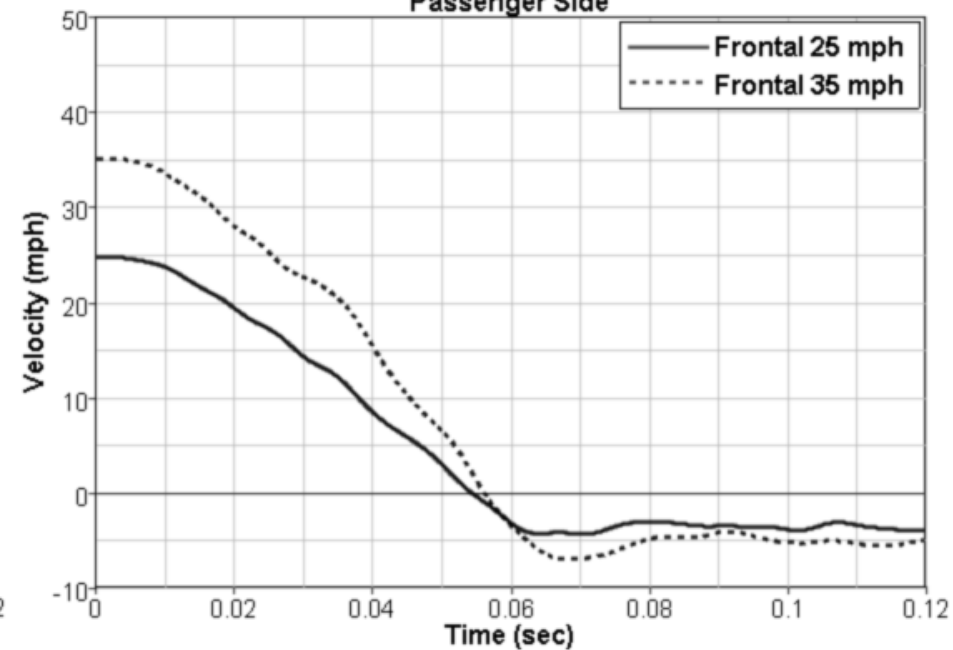
Passenger Side



Driver Side



Passenger Side



40% overlap ODB @ 25 & 40 mph

